January 4th, 1943

Brown-Root, Inc

D M Cashin, Agent

Joplin, Missouri

SUBJECT

Zinc and Lead Ore Reserves in the Central Drainage District of Jasper County, Missouri.

BY.

William M Stewart, Registered Professional Mining Engineer in Missouri and Oklahoma, of over thirty years experience in the Tri-State Zinc & Lead District and in direct contact with the mining operations in the sheet ground horizon in the Webb City Area from 1908 through 1919, and also familiar with the activities, both drainage and mining operations, from 1919 to the present time *

LOCATION

A mineralized area averaging 2 miles wide from 3½ miles Northwest of Webb City, Missouri, to 3½ Southeast of Webb City, containing 7,826 acres

* The drill hole analysis, the area analysis, the delineating of the developed and probable ore bodies and the figuring of tonnage was done in collaboration with Otto Ruhl, Engineer of the U S Bureau of Mines

LEASES As of 1-1-43

Leases in hand @ 5% Royalty	5,540	acres
Leases in process of closing at 5% Royalty	740	acres
" " negotiation @ 5% Royalty	370	acres
TOTAL	6,650	acres

6,650 Acres is 85 % of Mineralized Zone Acreage

5,540 " " 71 % " " " " "

MILL CAPACITY PROPOSED

10,000 Rock Tons per 24 hour day Heavy-Media Separation Process 3,500,000 Rock Tons per year, 350 day basis 98,000 Concentrate Tons 85,750 Tons Zinc Sulphide

ORE RESERVES As of 1-1-43

Based on a 13 0 foot face and 2 8% Recovery Sheet Ground Horizon

Developed Ores	19,192,000 R T	537,400 C T
Probable Ores	6,869,000 R T	211,500 C T
Possible Ores	10,488,000 R.T.	293,600 C T
TOTAL	36,549,000 R T	1,042,500 C T
	1ST OPERATIONS	
Developed Ores	12,067,000 R T	338,400 C T
Probable Ores	1,985,000 R T	80,400 C T
Possible Ores	5,018,000 R T	153,100 C T
TOTAL 1ST OPERATIONS	19,070,000 R T	571,900 C T

LIFE

Developed Ores, Entire Drainage Area	5 5 years
Developed & Probable Ores, Entire Drainage Area	7 5 years
Developed, Probable & Possible Ores, Entire Drainage Area	10 5 years

COSTS

Mining & Milling per Rock Ton = $ 1 78

Mining & Milling per Concentrate Ton = $63 56

In arriving at these costs a breakdown of every phase was studied in the light of today's mining and milling operations and contemplates mechanization whenever possible in mine and mill

PRICES AND VALUES

60% of Zinc Sulphide $55 28 plus $29 70 Bonus = $ 84 98 per Ton

79% of Lead Sulphide $75 54 plus $41 80 Bonus = $117 34 per Ton

Concentrate Price (Ratio Concentrates 87 5% Zinc Sulphide 12 5% Lead Sulphide from 1915-1917 actual production, high face period) = $89 02

$ 4.45 = Royalty @ 5%

$84 57 = Royalty deducted Concentrate Ton Value

$ 2 37 = Rovalty deducted Rock Ton Value

Remaining for Amortization, taxes, increased costs and profits $21.00 per C.T

Remaining for Amortization, taxes, increased costs and profits $00 59 per R T

HISTORY, RECOVERIES
&
BASIS OF ANALYSIS

From 1909 to 1919 some one hundred and forty-six mining Companies, in the Oronogo to Duenweg district and some 15 companies in the Joplin district, produced from the sheet ground horizon 53,655,600 Rock Tons of ore, 1,087,355 tons of Zinc Sulphide and 221,210 tons of Lead Sulphide, a total of 1,308,565 tons of concentrates from 1,420 acres, 17 % of the outlined mineralized zone in the Central Drainage District, Developed and Probable areas in this report would amount to an additional 11 % of the mineralized zone An analysis of this production, having in mind the mill efficiency of the various periods, shows that the mineral content of the ores from an average face of 13 foot was 3.8% The present day mill efficiency of from 80 to 85% would show a recovery from these ores of from 3.1% to 3.3% I am of the opinion that our estimated recovery of 2 8% from a face of 13.0 feet in this same horizon is conservative With a mill efficiency of 85%, a 13 foot face to recover 2 8% would contain a total of 5 15 inches of zinc and lead sulphides Less than one half a foot of solid concentrates in the 13 feet

Over a thousand drill holes in the mineralized zone were analyzed in delineating the developed and probable ore bodies shown on accompanying maps. Safety factors are noted in accompanying detailed analysis and were weighted in the light of available data and evidence. The possible tonnage set up

is derived from the safety factor in the various blocks and does not include the additional possible tonnage in the remaining but unproven 5,600 acres of the outlined mineralized zone nor does it include any of the upper horizons which were productive in the past. A deeper horizon, the Reeds Spring, which has been mined in both the north and south parts of the zone offers very interesting possibilities in the intervening areas

GEOLOGY

The Reserves as set out are in the Grand Falls Chert Member (Fowler's Beds N O P & O) of the Boone formation of Mississippian Age.

CAPITAL INVESTMENT

1st Period - Drainage Stage	$220,000 00
2nd Period - Surface Equipment Stage	285,000 00
3rd Period - Mine Development Stage	680,000 00
4th Period - Surface Haulage Stage	40,000 00
5th Period - Milling Stage	850,000 00
	$2,075,000 00
Working Capital	85,000 00
Drilling Exploration	10,000 00
Insurance Fund	100,000 00
	$2,270,000 00

Does not include amortization and taxes

Rock Ton Cost Breakdown

Breaking	$0.703	Screening	$ 0 035	
Machine Loading	0 145	Surface Haulage	0 210	
Mine Haulage	0 055	Gen Dewatering	0 025	
Hoisting	0 090	Exploration	0 020	
MINING	$0 993	Milling	0 370	*1
		Overhead	0.082	
		Insurance	0 045	
Total Mining & Milling Cost $1 78 per R T			0.787	

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*1 Distribution of 10,000 Rock Tons per day

Zinc & Lead Concentrates	=	280 tons
1½ inch rock	-	6375 tons
3/16 inch rock	-	2345 "
35 mesh - slime	-	1000 "
		10,000 tons

Respectfully submitted,

William M Stewart